

Claims

1. A method of wireless communication, including a mobile station (MS) maintaining at least a first direct mode group set (DGS) comprising an ordered list of two or more user groups together with their respective associated direct mode radio frequency (RF) channels, for the purpose of scanning for alternative RF activity among some or all of said groups, and using the list in direct mode communications with other mobile stations.
2. A method of direct mode radio communication according to claim 1, wherein  
for those groups in a selected DGS whose RF channel state is free or unknown,  
an MS conducts a channel surveillance procedure wherein each of said RF channels is sampled periodically to determine if there is any RF activity.
3. A method of direct mode radio communication according to claim 2, wherein samples of some or all consecutive group RF channels that whose state is free or unknown are conducted in a single frame.
4. A method of direct mode radio communication according to any one of the preceding claims, wherein  
if there is currently no group activity on any of the surveyed channels, then a first MS initiating a call or service (hereinafter a 'master MS') to start on any of the groups determines the physical and logical time division pattern (TDP) for all surveyed channels.

5. A method of direct mode radio communication according to claim 4, wherein all other MSs detecting the first call or service synchronise to the TDP, adopting the same frame and slot numbering as the first master MS.

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6. A method of direct mode radio communication according to any one of claims 4 and 5, wherein each master MS currently making a call or service will transmit a presence signal on a specific time slot.

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7. A method of direct mode radio communication according to claim 6, wherein the specific time slot in which a master MS transmits is related to the position within the DGS of the group that the said master MS is communicating with.

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8. A method of direct mode radio communication according to any one of claims 6 and 7 wherein the specific time slot in which a master MS transmits is within a TETRA request bit map associated frame related to the position within a DGS of the group that the said master MS is communicating with.

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9. A method of direct mode radio communication according to claim 8 wherein the master MS signals all call or service recipients that the TETRA request bit map associated time slots are not available for random access requests.

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10. A method of direct mode radio communication according to any one of claims 6 to 9 wherein the master MS transmits the presence signal on its respective group RF channel.

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11. A method of direct mode radio communication according to any one of claims 6 to 9 wherein the master MS transmits the presence signal on an alternative common control RF channel.

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12. A method of direct mode radio communication according to any one of claims 5 to 11 wherein any slave or idle MS surveys a specific time slot on a relevant channel to determine if there is any RF activity, said time slot and/or channel being related to the position within the DGS of the group that said slave or idle MS is currently surveying.

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13. A method of direct mode radio communication according to claim 12 wherein the groups whose channels the slave or idle MS surveys are those of which it is a member.

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14. A method of direct mode radio communication according to any one of the above claims where the MS alerts a user to a detected group call or service.

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15. A method of direct mode radio communication according to any one of claims 1 to 12 wherein the MS automatically switches to a detected call or service in a group assigned a higher rank in the DGS.

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16. A method of direct mode radio communication according to any one of the preceding claims wherein the MS is a TETRA MS.

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17. A mobile station for direct mode communication according to a method as claimed in any one of the preceding claims, characterised by;

storage means storing in use at least a first direct mode group set (DGS) comprising an ordered list of two or more user groups together with their respective associated direct mode radio frequency (RF) channels.

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18. A method of direct mode communication according to claim 1 and substantially as hereinbefore described with reference to the accompanying drawing.

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19. A mobile station according to claim 17 and substantially as hereinbefore described with reference to the accompanying drawing.